

HEALTH AND SAFETY ADVISORY

Legionellosis: A Cooling-Tower Hazard

What is the health risk?

Maintaining cooling towers can put you at risk of a respiratory infection by *Legionella* bacteria. *Legionella* can live in groundwater, lakes, rivers, ponds, and human-made water systems. Diseases can develop after a worker or a member of the general public inhales mist from contaminated water into the lungs. *Legionella* causes mainly two types of diseases: Legionnaires' disease and Pontiac Fever.



Ask the building owner for key information.

Ask the building owner for	Why?
<p>Water treatment program records</p> <p><input type="checkbox"/> Is a water treatment program in place using</p> <ul style="list-style-type: none"> • biocide inhibitors? • corrosion and scale inhibitors? • dispersants, surfactants, or filters? <p><input type="checkbox"/> Are water treatments continuously applied?</p>	<ul style="list-style-type: none"> • Organic matter, excess scale, corrosion, and bacterial growth in water can protect <i>Legionella</i> from biocides and can help it to grow. • Water does not continuously circulate, especially in systems that are cycled on and off. These conditions promote <i>Legionella</i> growth.
<p>Water monitoring records</p> <p><input type="checkbox"/> Is the water chemistry, such as pH, chloride concentration, etc., tested routinely?</p> <p><input type="checkbox"/> Are general bacteria levels in the water system routinely measured?</p> <p>For more information, refer to the Health and Safety Executive's publication <i>Legionnaires' disease</i> listed at the end of this advisory.</p>	<ul style="list-style-type: none"> • The water chemistry could change over time leading to a change in bacteria levels. • High levels of general bacteria indicate a greater chance of <i>Legionella</i> growth.
<p>Maintenance procedures</p> <p><input type="checkbox"/> Is the water drained if the system is shut down for more than three days? If not, are biocides added?</p> <p><input type="checkbox"/> Is system maintenance conducted at least twice per year (spring and autumn)?</p>	<ul style="list-style-type: none"> • <i>Legionella</i> bacteria can grow in standing water. • Damaged physical components (such as the drift eliminator) or clogged spray nozzles could increase the risk of exposure to mists.

Inspect the cooling tower before working on it.

What to look for	Why?
<p>Water Basin</p> <p><input type="checkbox"/> Does the water have any of the following?</p> <ul style="list-style-type: none"> • green or brown algae • an accumulation of dirt, trash, or other debris • a foul smell • a colour of rust or corrosion <p><input type="checkbox"/> Is the water temperature between 20°C (68°F) and 45°C (113°F)?</p> <p>At a minimum, wear an N-95 particulate-filter respirator if either of these conditions exist.</p>	<ul style="list-style-type: none"> • Biocides are less effective when organic matter is present. This could indicate bacterial growth. • <i>Legionella</i> doesn't grow well in water temperatures below 20°C (68°F).
<p>General Construction</p> <p><input type="checkbox"/> Are the sump and sump screen clear of trash and debris?</p> <p><input type="checkbox"/> Are spray nozzles clogged?</p> <p><input type="checkbox"/> Are pipe dead-legs or redundant piping bled of water? This should be done once biocide is added.</p> <p><input type="checkbox"/> Is the superstructure free of foul smell or wood decay?</p>	<ul style="list-style-type: none"> • Biocides and other inhibitors could be inactivated by trash and debris. • Scale, slime, corrosion, or sediment can clog spray nozzles. This could enhance bacterial growth. • Disinfectants may not reach areas of poor water circulation, allowing <i>Legionella</i> to grow.

Notify the building owner to take action if conditions could promote *Legionella* growth.

Where can I get more information?

- ▶ *Information bulletin: Workplace health and safety guideline—Legionella* by the Ontario Ministry of Labour. Download it free from: www.labour.gov.on.ca/english/hs/pubs/ib_legionella.php
- ▶ *Legionellosis: Causes and controls* by the Infrastructure Health & Safety Association. Download it free from: www.ihsa.ca/pdfs/occupational_health/legionellosis.pdf
- ▶ *Legionnaires' disease—The control of Legionella bacteria in water systems: Approved code of practice and guidance*, Health and Safety Executive (UK). www.hsebooks.com
- ▶ *Minimizing the risk of Legionellosis associated with building water systems*, American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) guideline 12-2000. www.ashrae.org